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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/509,457	05/02/2005	Sabine Mollus	DE 020086	2736
24737	7590	12/15/2005	EXAMINER	
PHILIPS INTELLECTUAL PROPERTY & STANDARDS P.O. BOX 3001 BRIARCLIFF MANOR, NY 10510			RAMIREZ, JOHN FERNANDO	
			ART UNIT	PAPER NUMBER
			3737	
DATE MAILED: 12/15/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

TMA

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/509,457	MOLLUS ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	John F. Ramirez	3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 02 May 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 9/28/04 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 9/28/04 - 7/18/05
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 101*

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 10 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claim is directed to a computer program, which constitutes non-statutory subject matter.

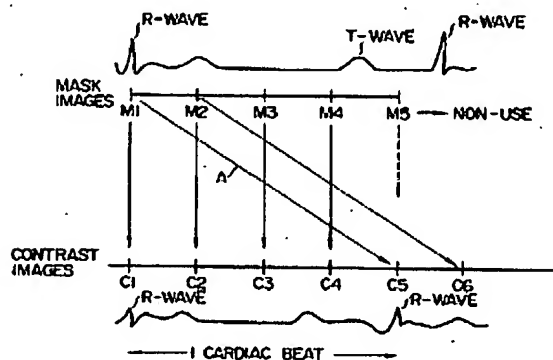
### *Claim Rejections - 35 USC § 102*

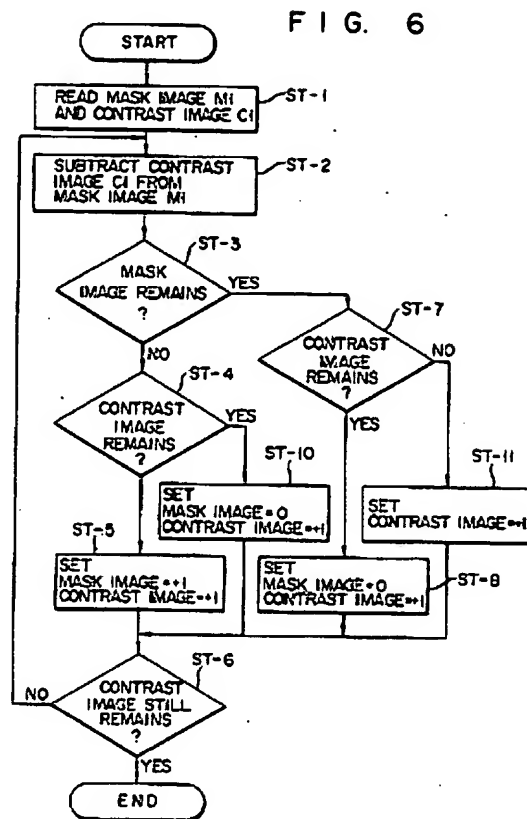
The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Claims 1, 4-6, 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohe (US 4,729,379).

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With respect to claim 1, Ohe shows in Figures 4 and 6, a method of determining a corresponding image for a reference image from an image sequence of a moving object by means of a first and a second motion signal, in which the first and the second motion signal represent the respective variation in time of the states of motion of a first motion and a second motion of the object, the image sequence represents the first motion of the object as a sequence of images of states of motion, the reference image represents a state of motion from the second object motion and is acquired at a reference instant during the second motion of the object including the following steps: a) determining a similarity function by way of a similarity comparison of the first and the second motion signal, b) determining a correspondence instant in the first motion signal

by means of the similarity function, the correspondence instant corresponding to the acquisition instant of the reference image from the second motion signal, c) determining, using the first motion signal, that image of the image sequence whose acquisition constant corresponds at least approximately to the correspondence instant.

With respect to claims 4-6, Ohe shows in figures 1, 2A and 2B a method characterized in that the first and the second motion signal form an electrocardiographic signal and that the images of the image sequence and the reference image represent states of motion of a human or animal heart, characterized in that the blood vessels of the heart are filled at least partly with a contrast medium either in images of the image sequence or in the reference image, characterized in that the image sequence forms an X-ray image sequence and/or the reference image forms an X-ray image (col. 2, lines 22-57).

With respect to claims 8-10, Ohe shows in Figure 3 a system which includes a data processing unit for determining a corresponding image of a moving object for a reference image from an image sequence by means of a first and a second motion signal (50, Figure 3), the data processing unit being arranged to carry out a method as claimed in claim 1, an examination apparatus which includes an X-ray image detector and means for the detection of electrocardiographic signals, which apparatus includes a system as claimed in claim 8 (90, Figure 3), a computer program or computer program product which is arranged to cooperate with a data processing unit in such a manner that the data processing unit is capable of carrying out a method as claimed in claim 1 (50, Figure 3).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 3, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohe in view of Vullings (*Automated ECG segmentation with Dynamic Time Warping*) in further view of Beier (*Advanced Subtraction Angiography: Mask selection and Image Registration*) and in further view of Urbano et al. (US 6,228,030).

In reference to claims 2, 3 and 7, Ohe teaches all the limitations of the claimed subject matter except for mentioning specifically the steps of characterizing in that the similarity function is obtained by means of the so-called dynamic time warping method, characterizing in that an interpolation image is formed from the corresponding image and a further image from the image sequence, which interpolation image represents at least substantially the state of motion of the object at the correspondence instant, and additionally, characterizing in that the image sequence and/or the reference image forms an ultrasound image.

However, the steps of 1) characterizing in that the similarity function is obtained by means of the so-called dynamic time warping method, 2) characterizing in that an interpolation image is formed from the corresponding image and a further image from the image sequence, which interpolation image represents at least substantially the

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state of motion of the object at the correspondence instant, and 3) characterizing in that the image sequence and/or the reference image forms an ultrasound image are considered conventional in the art as evidenced by the teachings of Vullings (*Automated ECG segmentation with Dynamic Time Warping*), Beier (*Advanced Subtraction Angiography: Mask selection and Image Registration*) and Urbano et al. (US 6,228,030).

The Vullings publication teaches the step of characterizing in that the similarity function is obtained by means of the so-called dynamic time warping method. Moreover, the Beier publication teaches the step of characterizing in that an interpolation image is formed from the corresponding image and a further image from the image sequence, which interpolation image represents at least substantially the state of motion of the object at the correspondence instant, and Furthermore, the Urbano et al., patent teaches the step of characterizing in that the image sequence and/or the reference image forms an ultrasound image.

Based on the above observations, for a person of ordinary skill in the art, modifying the method disclosed by Ohe, with the above discussed enhancements would have been considered obvious because such modifications would have a great effect upon image quality.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John F. Ramirez whose telephone number is (571) 272-8685. The examiner can normally be reached on (Mon-Fri) 7:30 - 4:00 p.m.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian L. Casler can be reached on (571) 272-4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JFR  
12/12/05

  
BRIAN L. CASLER  
SUPERVISORY PATENT EXAMINER  
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